CHAPTER 2

Description

Physical Description

The MGX 8240 shelf is a multi-slot chassis, supporting multiple PSM cards and their associated interface I/O assemblies. The shelf is designed as an integrated unit containing the following:

- 16-slot card cage (15 slots usable for PSMs; 1 divided slot for IMC or common equipment card).
- Single 16-slot mid-plane.
- Three independent, hot-swappable fan trays (any two of which can adequately cool the fully loaded chassis).
- Removable air filter.
- -48 VDC Power Input Module with dual redundant power entries.
- Individual face plates on each PSM Module for Airflow and Electro-Magnetic Interference (EMI) Sealing, as well as Alarm and Connector Identification.
- Removable Cable Management System.

The shelf is designed for center mounting only. It is NEBS compliant with the GR-63-CORE and GR-1089-CORE requirements.

Figure 2-1 MGX 8240 Front View

Physical Interfaces & Specifications

This section describes the types of physical interfaces supported by the MGX 8240.

Table 2-1 lists the switch physical interfaces under different conditions.

Table 2-1 Switch Physical Interfaces Supported

	Number of Ports Supported		
Physical Interface	**No Redundancy**	**1 for 4 Redundancy Support**	**Each PSM Blade**
DS3 Access Port	45	36	3
DS1 ports under DS3	1,260	1,008	84
DS0 ports under DS3	30,240	24,192	2,016
SONET ATM Trunk Ports	15 (30 with APS)	12 (24 with APS)	1 (2 with APS)

Table 2-1 Switch Physical Interfaces Supported

Physical Interface	Number of Ports Supported		
	No Redundancy	1 for 4 Redundancy Support	Each PSM Blade
RS232 Serial Ports for CLI.	16	16	1
10/100BaseT Ethernet Ports for network management			1

Table 2-2 shows the dimensions of an unmounted MGX 8240 unit.

Table 2-2 Unmounted MGX 8240 Dimensions

Dimension	Value
Depth (without cable management)	18.5 in.
Depth (withcable management)	22.5 in.
Width (without mounting brackets)	21.25 in.
Height	33.25 in.(19 RU)
Weight (empty)	100 lbs.
Weight (fully loaded)	220 lbs.
Shelf wattage (fully loaded)	1500 Watts

Figure 2-2 MGX 8240 Physical Dimensions

The shelf is designed to be center-mounted in a standard telecom 23-inch relay rack. Two chassis can be mounted in a standard 7-foot configuration. There should be at least 5” betweenthe two chassis.

Module Cage and Slot Designation

The MGX 8240 shelf has a 16-slot card cage. There are 15 full-size slots and 2 half-size slots. The two half-sized slots are for IMCs.

An MGX 8240 with IMC redundancy uses two IMCs, one primary and one backup. An IMC fits into each of the two half-size slots. At installation, usually the top IMC is primary, and the bottom IMC is backup. Figure 2-3 shows the slot designation for the cards.

Note If only one IMC is to be used, it should be placed in Slot 1A.

Figure 2-3 Slot Designation (Front View)

The PSM slots are numbered 1 through 16 (from left to right) on the bottom of the card cage.

Slot 1:

- Reserved for common equipment purposes (the IMC card).
- Divided into two slots (A and B) for the IMC card. These slots are wired in parallel.
- Provides:
  - Ethernet connectivity for remaining 15 slots.
  - BITS A and B connections for the user.
  - Alarm relay connections for the user.

Slots 2 through 16:

- Are identical with respect to the PSM cards and Interface I/O Mid-plane.
- Are wired for Ethernet connections and have point-to-point connection to slot 1.
- Are coupled to both BITS A and B.
- Contain alarms relay control signals for four contact closures.

The Mid-plane design:

- Eliminates most of the discrete wiring within the shelf.
- Provides connection between the front and back cards.
- Provides the interconnection for the cards, interface I/O panels, fan tray, and -48 VDC Power Input.
- Supports hot swapping of cards, Interface I/Os, and fan tray.
- Has no active circuitry.

I/O Panels are installed in the rear of the chassis. Two types of I/O cards exist:

1. The PSM I/O, with two OC3 transceivers, three DS3 ports, and an RJ45 CRAFT port.
2. The IMC I/O card, with 1 Ethernet port, 1 RJ45 console port, and BITS A and BITS B ports, and a D connector for alarms.

A blank I/O panel is supplied to cover slots that do not contain one of the above cards.

Fan Trays

The MGX 8240 incorporates three fan trays. Each fan tray:

- Is a self-contained card installed from the front of the shelf.
- Contains three fans.
- Is hot-swappable for ease of servicing.
- Has a bi-colored LED to show Ready (green) and Fault (red).

Any two of the three fan trays are sufficient to cool a fully-loaded chassis. Each fan has a tachometer output. These nine outputs are bused to each of the 15 PSM card slots.

During configuration, the installer should configure at least one PSM card to monitor and report fan status. All other PSM cards have this feature disabled as the default.

Upon detection of any fan failure, the PSM performs the following:

- Sets a major alarm.
- Sets the fan tray LED state to Fault on the fan tray containing the failed fan.

Note If a fan tray fails, leave it in place until a replacement unit is available. The chassis can runo n two fan trays, but when a fan tray is removed, all three fans on the tray appear to fail. This condition generates fan failure alarms.

Air Intake and Filtering

The shelf is equipped with a removable reusable air filter. Air intake is from the front and from the sides to maximize the intake air volume. Figure 2-4 represents the front and side air intakes.

Figure 2-4 Air Flow

Power Module

The DC input module provides the following features:

- Integral On/Off Switch with Circuit Breaker.
- EMI Filtering.
- Terminal Block for A and B Power, A and B Power RTN, and a single Chassis and Logic Ground Terminal.

Cable Management System

A cable management system is provided with the MGX 8240. It is removable for those customers who wish to use other commercially available systems.

PSM Module and Faceplates

On the chassis, faceplates on each PSM card provide EMI protection and visual indicators as to the card's status. The PSM faceplate has LED indicators to display alarm status (see Figure 2-5).

Unused slots have blank faceplates.

All external connectivity to the PSM module is through its midplane connector. Each PSM module has its own temperature sensor for detecting over-temperature conditions, and generates an individual over-temperature major alarm.

Multiple PSM modules per chassis can be configured to back up as many as four primary PSM modules in the chassis (See "PSM Card Redundancy" section on page 1-6).

Figure 2-5 PSM Modules (Front View)

LED Indications

The LEDs indicate the following

:

- Critical—On a Critical Event, this LED goes from green to red.
- Major—On a Major Event, this LED goes from green to red.
- Minor—On a Minor Event, this LED goes from green to yellow.
- Ready—When the Boot-up Process has successfully completed, this LED goes from red to green.

- Redundant Switch Over—applies only to Primary PSM modules. It indicates that the Backup PSM has switched out this primary. To indicate that the module is switched out, this LED goes from green to yellow.
- The RS232/RJ11 connector is for Factory Use only.

The PSM I/O Modules are shown in Figure 2-6.

Figure 2-6 PSM I/O Module

The PSM I/O module provides external connectivity (physical termination) on behalf of a PSM module. The PSM I/O module normally connects to the PSM module across the midplane in the same slot position. If a PSM module fails, the I/O module can be switched (controlled by the backup PSM module) to route its midplane connections to the backup PSM module. The PSM I/O module provides the following external connectors:

- Three DS3 (BNC) connectors for channelized DS3 service interfaces.
- Two OC3 connectors (second connector used for SONET 1+1 APS) for ATM trunk.
- RS232/RJ45 Console port for CMDR.

IMC Card

The Integrated Management Controller (IMC) provides centralized out-of-band management connectivity to the MGX 8240 switch. The IMC can manage (detect and reset) all PSM cards in a switch—up to 15. The IMC has the following functions:

- Allows the MGX 8240 to be seen and accessed from the Ethernet as a single entity with a single IP address, instead of as 15 separate PSM cards or switches. The IMC does Network Address Translation, routing IP traffic to each card within the chassis. The NAT supports FTP, Telnet, SNMP, and ICMP traffic.
- Provides timing to all cards; timing comes from two BITS clocks through the IMC.
- Monitors the chassis information regarding fan trays, temperature, alarm relay, and power input and communicates results to the management station.
- Monitors the IMC card; each of the two cards in the chassis monitors the other.
- Sends traps to management station regarding status of IMC card and PSM cards.

Figure 2-7 IMC Module (Faceplate and I/O)

The IMC I/O card has an RJ45 Connector for the Shelf Ethernet Interface, an RJ45 Connector for the Shelf RS232 console interface, a 15-pin connector for the 4 alarm relay contacts, and 2 BITS inputs.

The Ready LED changes from yellow to green when the IMC becomes primary, and from green to yellow when the IMC becomes secondary.

The RJ11/RS232 connector on the IMC front card is for factory use only.